# ATTACHMENT L – 40 CFR PART 264, SUBPART BB

# SUBPART BB AIR EMISSION STANDARDS FOR EQUIPMENT LEAKS

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# 1. GENERAL INFORMATION SUBPART BB

## 1.1. General Applicability

Subpart BB of 40 CFR 264 (Subpart BB) applies to equipment at hazardous waste treatment, storage and disposal facilities which contains or contacts hazardous wastes with 10 percent or more (by weight) organics content.

## 1.2. Site Applicability

Organic waste consolidation at the Heritage treatment facility in Coolidge is subject to the requirements of Subpart BB. No other system has the potential to contain or contact hazardous wastes with 10 percent or more (by weight) organics.

## 1.3. Definitions (40 CFR 264.1031)

### *1.3.1. Light Liquid Service*

The vapor pressure of one or more of the components in the waste stream is greater than 0.3 kilopascals (kPa) at 20°C, the total concentration of the pure components having a vapor pressure greater than 0.3 kPa at 20°C is equal to or greater than 10% by weight, and the fluid is a liquid at operating conditions.

### *1.3.2. Closed-Vent System*

A system that is not open to the atmosphere and that is composed of piping, connections, and if necessary, flow-inducing devices that transport gas or vapor from a piece or pieces of equipment to a control device.

### *1.3.3. Control Device*

An enclosed combustion device, vapor recovery system (e.g., condenser or adsorber), or flare. Any device the primary function of which is the recovery or capture of solvents or other organics for use, reuse, or sale is not a control device.

### *1.3.4. Open-Ended Valve or Line*

Any valve, except pressure relief valves, having one side of the valve seat in contact with process fluid and one side open to the atmosphere, either directly or through open piping.

### *1.3.5. No Detectable Emissions*

An instrument reading of less than 500 ppm above background as measured in accordance with 40 CFR 264.1063(b) and (c), and Method 21 - Determination of Volatile Organic Compounds Leaks, (40 CFR 264 Part 61, Appendix A). A copy of Method 21 is located in Appendix A for reference.

### *1.3.6. Hazardous Waste Management Unit Shutdown*

A work practice or operational procedure that stops operation of a hazardous waste management unit or part of a hazardous waste management unit. An unscheduled work practice or operational procedure that stops operation for less than 24 hours is not a hazardous

waste management unit shutdown. The use of spare equipment and technically feasible bypassing of equipment without stopping operation are not hazardous waste management unit shutdowns.

1.4. Service Classification

Organic waste consolidation meets the definition of “light liquid service” as described in 40 CFR 264.1031. Supporting documentation that meets the requirements of 264.1063(h) for determining whether the system is in light liquid service will be maintained as part of the facility operating record.

1.5. Equipment Marking

All equipment subject to Subpart BB will be marked in such a manner that it can be distinguished readily from other pieces of equipment. All equipment subject to Subpart BB will be assigned a unique identification number prior to implementation of Subpart BB. This information will be maintained as part of the facility operating record.

1.6. Delay of Repair

Delay of repair is allowed if the repair is technically infeasible without a hazardous waste management unit shutdown.

Delay of repair is also allowed if the equipment is isolated from the hazardous waste management unit and does not continue to contain or contact hazardous waste with 10 percent or more (by weight) organics content.

## 2. PUMPS IN LIGHT LIQUID SERVICE (40 CFR 264.1052)

2.1. Pump Identification

The pumps subject to Subpart BB requirements for pumps in light liquid service will be identified on a P&ID maintained as part of the facility operating record.

2.2. Inspection and Monitoring

Each pump will be visually inspected once each calendar week for dripping liquids. If liquids are present, a leak is detected.

Each pump will be monitored once each calendar month. Pumps operating with dual mechanical seals in accordance with 40 CFR Part 264.1052(d) will not require monthly monitoring. Monitoring will be done in accordance with Method 21. If an instrument reading of 10,000 ppm or greater is obtained, a leak is detected.

2.3. Repair Requirements

A first attempt at repair (e.g., tighten the packing) shall be made within five (5) calendar days of detecting the leak.

Repair must begin as soon as practicable, but be made within 15 calendar days of detecting the leak except as provided in Sections 1.6 and 2.4 (Delay of Repair).

2.4. Additional Delay of Repair

Additional delay of repair is allowed if the repair requires the use of a dual mechanical seal that includes a barrier fluid. Delay of repair is also allowed if the repair is completed as soon as practicable, but not later than six (6) months after the leak is detected.

## 3. PRESSURE RELIEF DEVICES IN LIGHT LIQUID SERVICE (40 CFR 264.1058)

There are no pressure relief devices for the organic waste consolidation that are subject to Subpart BB.

## 4. OPEN-ENDED VALVES AND LINES (40 CFR 264.1056)

Open ended valves/lines/hoses associated with the organic waste consolidation are equipped with a cap, blind flange, plug, or a second valve.

The open ended valves/lines/hoses will remain sealed except when in use.

## 5. VALVES IN LIGHT LIQUID SERVICE (40 CFR 264.1061)

5.1. Alternative Standard Selection

Heritage elects to have all the valves associated with organic waste consolidation within comply with the alternative standard that allows no greater than 2% of the valves to leak. Heritage considers this document to serve as notification of its intention.

5.2. Monitoring

All valves associated with organic waste consolidation are/will be monitored within a one week period in accordance with 40 CFR 264.1063(b) and Method 21.

Monitoring will be conducted initially upon designation (e.g. when first subject to rule) and annually thereafter. The ADEQ may request additional performance tests at other times. A copy of the performance test description and test results for the initial performance test shall be submitted to ADEQ.

If an instrument reading of 10,000 ppm or greater is obtained, a leak is detected.

The leak percentage shall be determined by dividing the number of leaking valves by the total number of valves. If there are less than 50 total valves, then no valves are allowed to leak to comply with the alternative standard.

5.3. Repair Requirements

A first attempt at repair shall be made within five (5) calendar days of detecting the leak. First attempts include, but are not limited to, tightening or replacement of bonnet bolts, tightening of packing gland nuts, or injection of lubricant in lubricated packing.

Repair must begin as soon as practicable, but be made within 15 calendar days of detecting the leak except as provided in Sections 1.6 and 5.4 (Delay of Repair).

5.4. Additional Delay of Repair

Additional delay of repair is allowed if Heritage determines emissions of purged material resulting from immediate repair are greater than the emissions likely to result from the delay of repair. When repairs are affected, the purged material will be collected and destroyed or recovered in a control device that complies with 40 CFR Part 264.1060.

## 6. FLANGES AND OTHER CONNECTORS (40 CFR 264.1058)

Flanges and other connectors for the organic waste consolidation include such items as screwed connectors, and flexible connections.

6.1. Monitoring

If evidence of a potential leak is found by visual, audible, olfactory, or other detection method, the equipment will be monitored in accordance with 40 CFR 264.1063(b) and Method 21 within five (5) calendar days of discovery.

If an instrument reading of 10,000 ppm or greater is obtained, a leak is detected.

6.2. Repair Requirements

A first attempt at repair shall be made within five (5) calendar days of detecting the leak. First attempts include, but are not limited to, tightening or replacement of bonnet bolts, tightening of packing gland nuts, or injection of lubricant in lubricated packing.

Repair must begin as soon as practicable, but be made within 15 calendar days of detecting the leak except as provided in Section 1.6 (Delay of Repair).

## 7. TEST METHODS AND PROCEDURES (40 CFR 264.1063)

Leak detection monitoring will be done in accordance with 40 CFR 264.1063(b) and Method 21 - Determination of Volatile Organic Compound Leaks. A copy of Method 21 is included in Appendix A for reference.

The detection instrument will meet the specifications set forth in Method 21 Sections 3.1.1 and 3.1.2. The instrument will be calibrated before use on each day of its use as specified in Method 21.

### 7.1. Procedures for Detectable Emissions

In addition to the requirements above, the background level will be determined in accordance with Method 21.

The arithmetic difference between the maximum concentration indicated by the instrument and the background level is compared with 500 ppm for determining if a leak is present.

## 8. RECORDKEEPING REQUIREMENTS (40 CFR 264.1064)

For each piece of equipment associated with organic waste consolidation subject to Subpart BB, the following information will be recorded:

- Equipment identification number;
- Approximate location within the facility;
- Type of equipment (e.g., pump, valve, etc.);
- Percent by weight of total organics in the hazardous waste stream at the equipment;
- Hazardous waste state at the equipment (e.g., gas/vapor or liquid); and
- Method of evaluation of compliance with the standard (e.g., monthly leak detection and repair, visual inspection, etc.).

When a leak is detected, the following will be performed:

- A weatherproof tag with the equipment identification number and the date the potential leak was detected will be attached to the leaking equipment. This tag will be removed after the repair is made, except for a valve in accordance with 40 CFR 264.1064(c)(2) and (3).
- Information regarding the detection of the leak will be recorded as specified in 264.1064(d) and summarized below:
    - Instrument, operator, and equipment identification;
    - Date evidence of potential leak found for flanges and other connectors;
    - Date leak detected, dates repair attempted, and method applied;
    - Reasons and documentation for delay of repair, if applicable; and
    - Date of repair.
- The identification number, background level, and the maximum instrument reading will be recorded for each monitoring and inspection event.
- The percent of valves found leaking during each monitoring period will be calculated and recorded.

## 9. REPORTING REQUIREMENTS (40 CFR 264.1065)

Semiannual reporting is not required if leaks from valves and pumps are repaired within the specified time frames.

The semiannual report, if necessary, will include the information specified in 264.1065(a) and summarized below:

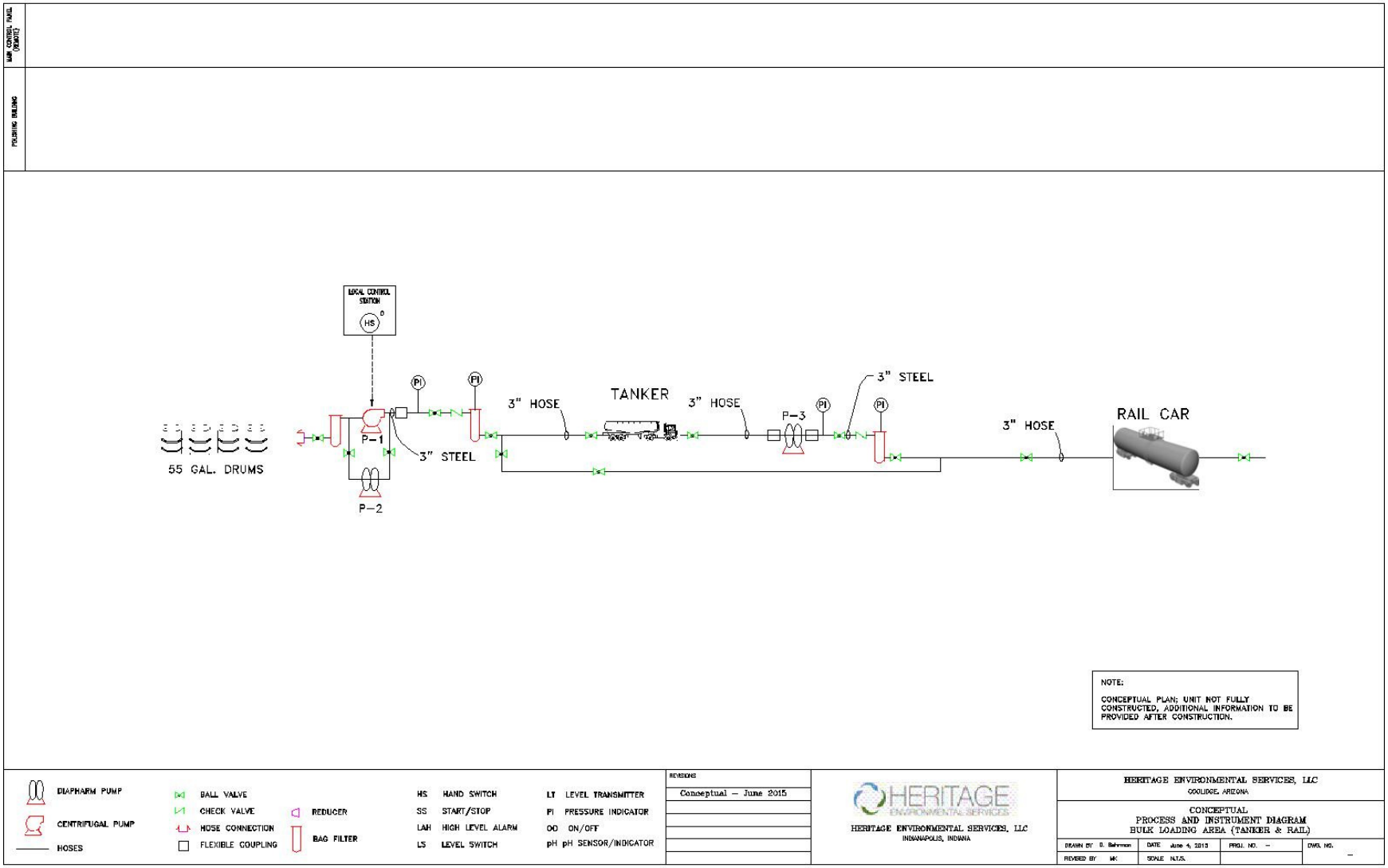
- Facility EPA ID number, name, and address;
- Equipment ID number for the equipment not repaired within the required time period; and
- Dates of hazardous waste management unit shutdowns (if any)

If a semiannual report is required, the report for the period of January through June shall be submitted by July 31 of that calendar year. The report for the period July through December shall be submitted by January 31 of the following calendar year.

# APPENDIX A

## Process and Instrumentation Diagram
## Organic Waste Consolidation

## Process and Instrumentation Diagram



# APPENDIX B

## List of Equipment Subject to 40 CFR Part 264 Subpart BB

| Equipment Identification | Approximate Location | Equipment Type | Percent by Weight Organics | Physical State | Method of Compliance With Standard |
|---|---|---|---|---|---|
| F-* | Inside Pumps | Flange | >10% | Liquid | 40 CFR Part 264.1058(a) |
| F- | Inside Pumps | Flange | >10% | Liquid | 40 CFR Part 264.1058(a) |
| F- | 200 Line | Flange | >10% | Liquid | 40 CFR Part 264.1058(a) |
| F- | 200 Line | Flange | >10% | Liquid | 40 CFR Part 264.1058(a) |
| F- | 200 Line | Flange | >10% | Liquid | 40 CFR Part 264.1058(a) |
| F- | 200 Line | Flange | >10% | Liquid | 40 CFR Part 264.1058(a) |
| C- | 200 Line | Other Connector | >10% | Liquid | 40 CFR Part 264.1058(a) |
| C- | Loading/Unloading Pad | Other Connector | >10% | Liquid | 40 CFR Part 264.1058(a) |
| C- | Loading/Unloading Pad | Other Connector | >10% | Liquid | 40 CFR Part 264.1058(a) |
| P- | Inside Pumps | Pump | >10% | Liquid | 40 CFR Part 264.1052(a)(1) and (2) |
| P- | Inside Pumps | Pump | >10% | Liquid | 40 CFR Part 264.1052(a)(1) and (2) |
| V- | 200 Line | Valve | >10% | Liquid | 40 CFR Part 264.1061 |
| V- | 200 Line | Valve | >10% | Liquid | 40 CFR Part 264.1061 |
| V- | 200 Line | Valve | >10% | Liquid | 40 CFR Part 264.1061 |
| V- | 200 Line | Valve | >10% | Liquid | 40 CFR Part 264.1061 |
| V- | 200 Line | Valve | >10% | Liquid | 40 CFR Part 264.1061 |
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Note: * Equipment not yet installed.

# APPENDIX C

## Inspection Log

## Inspection Log

EXAMPLE FORM

### Subpart BB Operating Log

| Equipment | Description | Hours Operating |
|---|---|---|
| Pumps | 2" diaphragm pump | 0 |
| Valves | | 0 |
| Flanges | | 0 |
| Lines | | 0 |

# APPENDIX D

## Method 21 - Determination of Volatile Organic Compound Leaks

## Method 21 -- Determination Of Volatile Organic Compound Leaks

1 Applicability and Principle

1.1 Applicability. This method is applicable for the determination of VOC leaks from process equipment. These sources include, but are not limited to, valves, flanges and other connections, pumps and compressors, pressure relief devices, process drains, open-ended valves, pump and compressor seal system degassing vents, accumulator vessel vents, agitator seals, and access door seals.

1.2 Principle. A portable instrument is used to detect VOC leaks from individual sources. The instrument detector type is not specified, but it must meet the specifications and performance criteria contained in Section 3. A leak definition concentration based on a reference compound is specified in each applicable regulation. This method is intended to locate and classify leaks only, and is not to be used as a direct measure of mass emission rate from individual sources.

2 Definitions

2.1 Leak Definition Concentration means the local VOC concentration at the surface of a leak source that indicates that a VOC emission (leak) is present. The leak definition is an instrument meter reading based on a reference compound.

2.2 Reference Compound means the VOC species selected as the instrument calibration basis for specification of the leak definition concentration. (For example, if a leak definition concentration is 10,000 ppm as methane, then any source emission that results in a local concentration that yields a meter reading of 10,000 on an instrument meter calibrated with methane would be classified as a leak. In this example, the leak definition concentration is 10,000 ppm and the reference compound is methane.)

2.3 Calibration Gas means the VOC compound used to adjust the instrument meter reading to a known value. The calibration gas is usually the reference compound at a known concentration approximately equal to the leak definition concentration.

2.4 No Detectable emission means a local VOC concentration at the surface of a leak source, adjusted for local VOC ambient concentration, that is less than 2.5 percent of the specified leak definition concentration. That indicates that a VOC emission (leak) is not present.

2.5 Response Factor means the ratio of the known concentration of a VOC compound to the observed meter reading when measured using an instrument calibrated with the reference compound specified in the applicable regulation.

2.6 Calibration Precision means the degree of agreement between measurements of the same known value, expressed as the relative percentage of the average difference between the meter readings and the known concentration to the known concentration.

2.7 Response Time means the time interval from a step change in VOC concentration at the input of the sampling system to the time at which 90 percent of the corresponding final value is reached as displayed on the instrument readout meter.

3. Apparatus

3.1 Monitoring Instrument.

3.1.1 Specifications.

a. The VOC instrument detector shall respond to the compounds being processed. Detector types which may meet this requirement include, but are not limited to, catalytic oxidation, flame ionization, infrared absorption, and photoionization.
b. Both the linear response range and the measurable range of the instrument for each of the VOC to be measured, and for the VOC calibration gas that is used for calibration, shall encompass the leak definition concentration specified in the regulation. A dilution probe assembly may be used to bring the VOC concentration within both ranges; however, the specifications for instrument response time and sample probe diameter shall still be met.
c. The scale of the instrument meter shall be readable to $\pm$2.5 percent of the specified leak definition concentration when performing a no detectable emission survey.
d. The instrument shall be equipped with an electrically driven pump to insure that a sample is provided to the detector at a constant flow rate. The nominal sample flow rate, as measured at the sample probe tip, shall be 0.10 to 3.0 liters per minute when the probe is fitted with a glass wool plug or filter that may be used to prevent plugging of the instrument.
e. The instrument shall be intrinsically safe as defined by the applicable U.S.A. standards (e.g., National Electric Code by the National Fire Prevention Association) for operation in any explosive atmospheres that may be encountered in its use. The instrument shall, at a minimum, be intrinsically safe for Class 1, Division 1 conditions, and Class 2, Division 1 conditions, as defined by the example Code. The instrument shall not be operated with any safety device, such as an exhaust flame arrestor, removed.
f. The instrument shall be equipped with a probe or probe extension for sampling not to exceed 1/4 in. in outside diameter, with a single end opening for admission of sample.

3.1.2 Performance Criteria.

(a) The instrument response factors for each of the VOC to be measured shall be less than 10. When no instrument is available that meets this specification when calibrated with the reference VOC specified in the applicable regulation, the available instrument may be calibrated with one of the VOC to be measured, or any other VOC, so long as the instrument then has a response factor of less than 10 for each of the VOC to be measured.
(b) The instrument response time shall be equal to or less than 30 seconds. The instrument pump, dilution probe (if any), sample probe, and probe filter, that will be used during testing, shall all be in place during the response time determination.
(c) The calibration precision must be equal to or less than 10 percent of the calibration gas value.
(d) The evaluation procedure for each parameter is given in Section 4.4.

3.1.3 Performance Evaluation Requirements.

a. A response factor must be determined for each compound that is to be measured, either by testing or from reference sources. The response factor tests are required before placing the analyzer into service, but do not have to be repeated at subsequent intervals.
b. The calibration precision test must be completed prior to placing the analyzer into service, and at subsequent 3 month intervals or at the next use whichever is later.
c. The response time test is required prior to placing the instrument into service. If a modification to the sample pumping system or flow configuration is made that would change the response time, a new test is required prior to further use.

3.2 Calibration Gases. The monitoring instrument is calibrated in terms of parts per million by volume (ppmv) of the reference compound specified in the applicable regulation. The calibration gases required for monitoring and instrument performance evaluation are a zero gas (air, less than 10 ppmv VOC) and a calibration gas in air mixture approximately equal to the leak definition specified in the regulation. If cylinder calibration gas mixtures are used, they must be analyzed and certified by the manufacturer to be within $\pm$2 percent accuracy, and a shelf life must be specified. Cylinder standards must be either reanalyzed or replaced at the end of the specified shelf life. Alternately, calibration gases may be prepared by the user according to any accepted gaseous standards preparation procedure that will yield a mixture accurate to within $\pm$2 percent. Prepared standards must be replaced each day of use unless it can be demonstrated that degradation does not occur during storage.

Calibrations may be performed using a compound other than the reference compound if a conversion factor is determined for that alternative compound so that the resulting meter readings during source surveys can be converted to reference compound results.

4. Procedures

4.1 Pretest Preparations. Perform the instrument evaluation procedures given in Section 4.4 if the evaluation requirements of Section 3.1.3 have not been met.

4.2 Calibration Procedures. Assemble and start up the VOC analyzer according to the manufacturer's instructions. After the appropriate warmup period and zero internal calibration procedure, introduce the calibration gas into the instrument sample probe. Adjust the instrument meter readout to correspond to the calibration gas value. NOTE: If the meter readout cannot be adjusted to the proper value, a malfunction of the analyzer is indicated and corrective actions are necessary before use.

4.3 Individual Source Surveys.

4.3.1 Type I-- Leak Definition Based on Concentration. Place the probe inlet at the surface of the component interface where leakage could occur. Move the probe along the interface periphery while observing the instrument readout. If an increased meter reading is observed, slowly sample the interface where leakage is indicated until the maximum meter reading is obtained. Leave the probe inlet at this maximum reading location for approximately two times the instrument response time. If the maximum

observed meter reading is greater than the leak definition in the applicable regulation, record and report the results as specified in the regulation reporting requirements. Examples of the application of this general technique to specific equipment types are:

a. Valves. The most common source of leaks from valves is the seal between the stem and housing. Place the probe at the interface where the stem exits the packing gland and sample the stem circumference. Also, place the probe at the interface of the packing gland take-up flange seat and sample the periphery. In addition, survey valve housings of multipart assembly at the surface of all interfaces where a leak could occur.
b. Flanges and Other Connections--For welded flanges, place the probe at the outer edge of the flange gasket interface and sample the circumference of the flange. Sample other types of nonpermanent joints (such as threaded connections) with a similar traverse.
c. Pumps and Compressors--Conduct a circumferential traverse at the outer surface of the pump or compressor shaft and seal interface. If the source is a rotating shaft, position the probe inlet within 1 cm of the shaft-seal interface for the survey. If the housing configuration prevents a complete traverse of the schft periphery, sample all accessible portions. Sample all other joints on the pump or compressor housing where leakage could occur.
d. Pressure Relief Devices--The configuration of most pressure relief devices prevents sampling at the sealing seat interface. For those devices equipped with an enclosed extension, or horn, place the probe inlet at approximately the center of the exhaust area to the atmosphere.
e. Process Drains--For open drains, place the probe inlet at approximately the center of the area open to the atmosphere. For covered drains, place the probe at the surface of the cover interface and conduct a peripheral traverse.
f. Open-Ended Lines or Valves--Place the probe inlet at approximately the center of the opening to the atmosphere.
g. Seal System Degassing Vents and Accumulator Vents--Place the probe inlet at approximately the center of the opening to the atmosphere.
h. Access Door Seals--Place the probe inlet at the surface of the door seal interface and conduct a peripheral traverse.

4.3.2 Type II--"No Detectable Emission".

Determine the local ambient concentration around the source by moving the probe inlet randomly upwind and downwind at a distance of one to two meters from the source. If an interference exists with this determination due to a nearby emission or leak, the local ambient concentration may be determined at distances closer to the source, but in no case shall the distance be less than 25 centimeters. Then move the probe inlet to the surface of the source and determine the concentration described in 4.3.1. The difference between these concentrations

determines whether there are no detectable emissions. Record and report the results as specified by the regulation.

For those cases where the regulation requires a specific device installation, or that specified vents be ducted or piped to a control device, the existence of these conditions shall be visually confirmed. When the regulation also requires that no detectable emissions exist, visual observations and sampling surveys are required. Examples of this technique are:

(a) Pump or Compressor Seals--If applicable, determine the type of shaft seal. Perform a survey of the local area ambient VOC concentration and determine if detectable emissions exist as described above.

(b) Seal System Degassing Vents, Accumulator Vessel Vents, Pressure Relief Devices--If applicable observed whether or not the applicable ducting or piping exists. Also, determine if any sources exist in the ducting or piping where emissions could occur prior to the control device. If the required ducting or piping exists and there are no devices, then it is presumed that no detectable emissions are present. If there are sources in the ducting or piping where emissions could be vented or sources where leaks could occur, the sampling surveys described in this paragraph shall be used to determine if detectable emissions exist.

4.3.3 Alternative Screening Procedure. A screening procedure based on the formation of bubbles in a soap solution that is sprayed on a potential leak source may be used for those sources that do not have continuously moving parts, that do not have surface temperatures greater than the boiling point less than the freezing point of the soap solution, that do not have open areas to the atmosphere that the soap solution cannot bridge, or that do not exhibit evidence of liquid leakage. Sources that have these conditions present must be surveyed using the instrument techniques of 4.3.1 or 4.3.2.

Spray a soap solution over all potential leak sources. The soap solution may be commercially available leak detection solution or may be prepared using concentrated detergent and water. A pressure sprayer or a squeeze bottle may be used to dispense the solution. Observe the potential leak sites to determine if any bubbles are formed. If no bubbles are observed, the source is presumed to have no detectable emissions or leaks as applicable. If any bubbles are observed, the instrument techniques of 4.3.1 or 4.3.2 shall be used to determine if a leak exists, or if the source has detectable emissions, as applicable.

4.4 Instrument Evaluation Procedures. At the beginning of the instrument performance evaluation test, assemble and start up the instrument according to the manufacturer's instructions for recommended warm-up period and preliminary adjustments.

4.4.1 Response Factor. Calibrate the instrument with the reference compound as specified in the applicable regulation. For each organic species that is

to be measured during individual source surveys, obtain or prepare a known standard in air at a concentration of approximately 80 percent of the applicable leak definition unless limited by volatility or explosivity. In these cases, prepare a standard at 90 percent of the saturation concentration, or 70 percent of the lower explosive limit, respectively. Introduce this mixture to the analyzer and record the observed meter reading. Introduce zero air until a stable reading is obtained. Make a total of three measurements by alternating between the known mixture and zero air. Calculate the response factor for each repetition and the average response factor.

Alternatively, if response factors have been published for the compounds of interest for the instrument or detector typek the response factor determination is not required, and existing results may be referenced. Examples of published response factors for flame ionization and catalytic oxidation detectors are included in Bibliography.

4.4.2 Calibration Precision. Make a total of three measurements by alternately using zero gas and the specified calibration gas. Record the meter readings. Calculate the average algebraic difference between the meter readings and the known value. Divide this average difference by the known calibration value and multiply by 100 to express the resulting calibration precision as a percentage.

4.4.3 Response Time Introduce zero gas into the instrument sample probe. When the meter reading has stabilized, switch quickly to the specified calibration gas. Measure the time from switching to when 90 percent of the final stable reading is attained. Perform this test sequence three times and record the results. Calculate the average response time.

5. Bibliography

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3. DuBoise, D.A., et al Response of Portable VOC Analyzers to Chemical Mixtures. U.S. Environmental Protection Agency, Research Triangle Park, NC Publication No. EPA 600/2-81-110. September 1981.